

- (a) 3 students from the college are chosen at random. Find the probability that all 3 students own a car. [1]

- (b) 16 students from the college are chosen at random. Find the probability that the number of these students who own a car is at least 2 and at most 4. [3]

- 1 At a college, the students choose exactly one of tennis, hockey or netball to play. The table shows the numbers of students in Year 1 and Year 2 at the college playing each of these sports.

	Tennis	Hockey	Netball
Year 1	16	22	12
Year 2	24	18	28

One student is chosen at random from the 120 students. Events X and N are defined as follows:

X : the student is in Year 1

N : the student plays netball.

- (a) Find $P(X|N)$. [1]

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- (b) Find $P(N|X)$. [1]

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- (c) Determine whether or not X and N are independent events. [1]

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One of the students who plays netball takes 8 shots at goal. On each shot, the probability that she will succeed is 0.15, independently of all other shots.

- (d) Find the probability that she succeeds on fewer than 3 of these shots. [3]

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- 4 A game for two players is played using a fair 4-sided dice with sides numbered 1, 2, 3 and 4. One turn consists of throwing the dice repeatedly up to a maximum of three times. When a 4 is obtained, no further throws are made during that turn. A player who obtains a 4 in their turn scores 1 point.

(a) Show that the probability that a player obtains a 4 in one turn is $\frac{37}{64}$. [2]

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Xeno and Yao play this game.

(b) Find the probability that neither Xeno nor Yao score any points in their first two turns. [1]

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Find the probability that Xeno scores 2 more points than Yao.

[3]

This image shows a blank sheet of white paper designed for writing practice. It features approximately 20 horizontal dotted lines spaced evenly down the page. A large, light gray watermark is oriented diagonally from the bottom-left towards the top-right, displaying the text "Dastpapirpenguin.com". The watermark is semi-transparent, allowing the underlying ruled lines to remain visible. There are no margins, text, or other markings on the page.

- 3** A company produces small boxes of sweets that contain 5 jellies and 3 chocolates. Jemeel chooses 3 sweets at random from a box.

- (a) Draw up the probability distribution table for the number of jellies that Jemeel chooses. [4]

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- [illegible]

- 2 In a certain country, the probability of more than 10cm of rain on any particular day is 0.18, independently of the weather on any other day.

- (a) Find the probability that in any randomly chosen 7-day period, more than 2 days have more than 10 cm of rain. [3]

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- (b) For 3 randomly chosen 7-day periods, find the probability that exactly two of these periods have at least one day with more than 10cm of rain. [3]

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